MUREP Small Business Technology Transfer (M-STTR) Planning Grants

Title: An Open-Source, Comprehensive Robot Dynamics and Control ROS2 Simulation Environment for Planetary Surface Missions

Institution: University of Hawaii at Manoa

City/State: Honolulu, Hawaii

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SUMMARY:
University of Hawaii at Manoa (UHM) and Astrobotic will collaborate on an open-source, comprehensive robot dynamics and control ROS2 simulation environment for planetary surface missions to enable rapid algorithm development and embedded system transfer for spaceflight missions. Robot dynamics and control simulations are critical for developing robot state perception, localization (that pinpoint where a robot is on a planetary surface), and control algorithms (that drive a robot from destination A to B). This robot functionality is critical for mission operations, like visiting scientifically significant destinations of interest and localizing where the robot is when sampling on a planetary surface.
Within the scope of this planning grant, most of the period of performance will allow UHM and Astrobotic to learn about each other's capabilities and systems, like presenting UHM's current terramechanics simulation and Astrobotic's CubeRover functionality. This planning grant will enable UHM and Astrobotic to prepare and write a Phase 1 STTR in which we identyi a template mission and system to act as constraints to demonstrate the proposed technology. Phase 1 will then be a launching point to develop the proposed technology.